U.S. Army Space and Missile Defense Command
Space and Missile Defense Technical Center
Space Technology Directorate

STARE

SMALL TACTICAL ARMS RECOGNITION EQUIPMENT

Small Tactical Arms Recognition Equipment (STARE) provides ground forces detection and location of small caliber weapons firings (e.g., snipers, direct fire weapons, mortars). STARE uses non-imaging infrared technology to detect the flash from weapons fires that are within the field-of-view of the sensor. It provides critical near-real time weapons firing detection and location information that ground forces need when deciding to either engage or evade enemy forces while operating in urban and complex terrain. Further, it collects photographic evidence for counter-fire operations and contributes to the ground common operational picture.

Protecting the Force

The Commander, U.S. Pacific Command, as well as other combatant commanders, state requirements for detection of ordnance events including hostile direct fire in complex terrain to support time sensitive counter-fire and counter-sniper operations. Military forces involved in counter-terrorism, urban warfare, or traditional roles (e.g. peacekeeping, peace enforcement, patrolling) do not have a method for immediately detecting and locating active enemy weapons that threaten operations. U.S. dismounted forces have a clear need to detect, locate, and engage active threats with precise fire to provide force protection and avoid destroying the urban landscape and minimizing collateral casualties.

Technologies that Address the Problem

STARE leverages the following technologies and programs:

- The Army's Battlefield Ordnance Awareness (BOA) Science and Technology Objective Program
  - — Non-Imaging Infrared (NOIR) to detect energy (i.e. muzzle flashes)
  - — Processing algorithms and database techniques to rapidly detect and classify muzzle flashes.
- Laser Range Finder/Designator (LRF/D) – coupled with the STARE NOIR to pinpoint the target
- Electro Optics/Infrared (EO/IR) to provide image of shooter
- Communications for providing data to support the Common Operational Picture

System Concept

A STARE ground-mobile system mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV) is strategically located at an airfield to provide force protection support to the area of operations. The infrared staring sensor detects a muzzle flash from a nearby ridgeline or from the top of a nearby building. An on-board processor detects the source of the flash in terms of a small caliber weapon type. Simultaneously, the processor calculates the azimuth of the flash and informs the crew of the direction from the HMMWV. The system operator cues the EO and LRF/D to the target. This enables the operator to rapidly identify the location and orientation of the target and provide targeting information to responding units. Based on this information, and the rules of engagement, rapid and precise engagement can eliminate or suppress the threat and reduce the possibility of casualties. Precise location of enemy shooters allows dismounted forces to engage the enemy while minimizing collateral damage.

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